

IN THE CLAIMS

Please amend the claims as indicated by the amended claim set below.

1. (Previously Presented) A catheter for use in a blood vessel, comprising:
 - an elongate body having an axis, a lumen along said axis, a proximal opening at one end, connected to the lumen and a front tip at a distal end of the body;
 - an elongate body section, wherein said elongate body is configured for axial motion of at least 50 mm relative to said second elongate body section; and
 - an elongate hydraulic fluid column in said lumen and adapted to apply a pushing force to said front tip in a distal direction, said force being applied at an application point, said force being suitable for extending said tip at least 50 mm relative to said elongate body.
2. (Original) A catheter according to claim 1, wherein said application point is nearer said front tip than said proximal opening.
3. (Previously Presented) A catheter according to claim 1, wherein said proximal opening is adapted to be outside a human body, when the catheter is in use.
4. (Previously Presented) A catheter according to claim 1, wherein said catheter is configured so that said liquid material does not drain into said blood vessel.
5. (Previously Presented) A catheter according to claim 1, wherein said column is adapted to be advanced from outside a body.
6. (Previously Presented) A catheter according to claim 1, wherein said body comprises a collapsed tube which extends from said tip to outside of said body and which said pushing force extends collapsed tube.
7. (Previously Presented) A catheter according to claim 1, wherein said tip pulls along a portion of said catheter, having a length of at least 5 times a diameter of the catheter, said length being pulled by said tip when pushing force is applied to said tip.

8. (Previously Presented) A catheter according to claim 1, wherein said body comprises a first, inner, tube and a second, outer tube, said tubes at least partially axially overlapping, wherein said pushing force extends one tube relative to the other tube.

9. (Original) A catheter according to claim 8, wherein said tip pulls at least a portion of said one tube with it when pushing force is applied to said tip.

10. (Original) A catheter according to claim 9, wherein said pulled section is too soft to be reliably pushed a distance of more than 500 mm in a human body, when the catheter is in use.

11. (Previously Presented) A catheter according to claim 9, wherein said tip pulls along a tube other than said tubes when pushing force is applied to said tip.

12. (Previously Presented) A catheter according to claim 9, wherein at least a portion of said one tube is adapted to be stored outside a human body when the catheter is in use and extends out of a catheter base of said catheter.

13. (Previously Presented) A catheter according to claim 9, wherein at least a portion of said one tube is adapted to be stored outside a human body, when the catheter is in use, in a configuration having a shortened axial dimension.

14. (Previously Presented) A catheter according to claim 8, wherein said inner tube extends when said force is applied.

15. (Previously Presented) A catheter according to claim 8, wherein said outer tube extends when said force is applied.

16. (Previously Presented) A catheter according to claim 8, wherein only one of said inner and said outer tubes substantially extends when said force is applied.

17. (Previously Presented) A catheter according to claim 8, wherein said fluid column is carried between said two tubes.

18. (Previously Presented) A catheter according to claim 8, wherein said fluid column is carried within the inner tube.

19. (Previously Presented) A catheter according to claim 8, comprising a tool attached at said tip.

20. (Original) A catheter according to claim 19, wherein said tool comprises a balloon attached at said tip.

21. (Original) A catheter according to claim 20, comprising a separate tube with a lumen for inflating said balloon.

22. (Original) A catheter according to claim 20, wherein said balloon is attached to a metallic inflation tube.

23. (Original) A catheter according to claim 20, wherein said inner tube serves as a lumen for inflating said balloon.

24. (Original) A catheter according to claim 23, wherein said inner tube serves as a lumen for inflating said balloon and not for said fluid column.

25. (Original) A catheter according to claim 20, wherein said balloon is inflated via a lumen which carries said fluid column.

26. (Original) A catheter according to claim 25, wherein said balloon is inflated using a higher pressure than used for extending said catheter.

27. (Original) A catheter according to claim 25, comprising a valve at said balloon for selectively allowing liquid flow into said balloon.

28. (Original) A catheter according to claim 27, wherein said valve is a pressure sensitive valve.
29. (Original) A catheter according to claim 27, wherein said valve is an externally actuated valve.
30. (Original) A catheter according to claim 29, wherein said valve is a stop valve in which a block is retracted from a port to said balloon to allow fluid under pressure to enter the balloon.
31. (Original) A catheter according to claim 29, wherein said valve is a rotating stop valve having at least two configurations, and in which a block is rotated from one configuration to a second one of said configurations to selectively seal or not seal a port to said balloon.
32. (Original) A catheter according to claim 21, wherein said balloon inflation tube is adapted to be stored outside a human body, when the catheter is in use.
33. (Original) A catheter according to claim 32, wherein said tube is stored in an axially collapsed state.
34. (Previously Presented) A catheter according to claim 8, wherein said tube is adapted to extend at least 50 mm.
35. (Previously Presented) A catheter according to claim 8, wherein said one tube is adapted to extend at least 150 mm.
36. (Previously Presented) A catheter according to claim 8, wherein said one tube is adapted to extend at least 250 mm.
37. (Previously Presented) A catheter according to claim 8, wherein said one tube is adapted to extend no more than 500 mm.

38. (Previously Presented) A catheter according to claim 8, comprising at least one stop which prevents relative motion between the two tubes greater than a pre-set distance.
39. (Original) A catheter according to claim 38, wherein at least one of said at least one stop is outside of said body.
40. (Original) A catheter according to claim 38, wherein at least one of said at least one stop is not in contact with said fluid.
41. (Original) A catheter according to claim 38, wherein said at least one stop comprises a wire extending out of said catheter and at least one movable brake section mounted on said wire.
42. (Original) A catheter according to claim 38, wherein said stop, when engaged, prevents liquid flow therethrough.
43. (Original) A catheter according to claim 38, wherein said stop, when engaged, does not prevent liquid flow therethrough.
44. (Original) A catheter according to claim 38, wherein said stop, is located within 50 mm of a proximal end of the extending tube.
45. (Original) A catheter according to claim 38, wherein said stop, is located at a distance of at least 50 mm from a proximal end of the extending tube.
46. (Original) A catheter according to claim 38, wherein when said tube is fully extended, said stop is located at a distal end of the non-extending tube.
47. (Original) A catheter according to claim 38, wherein when said tube is fully extended, said stop is located at a position spaced less than 50 mm from a distal end of the non-extending tube.

48. (Original) A catheter according to claim 38, comprising a plurality of axially spaced stops.
49. (Original) A catheter according to claim 38, wherein said stop is an element axially shorter than 5 mm.
50. (Original) A catheter according to claim 38, wherein said stop is an element axially longer than 5 mm.
51. (Previously Presented) A catheter according to claim 8, comprising at least one seal between said tubes.
52. (Original) A catheter according to claim 51, wherein said at least one seal is adapted for a particular outer tube inner diameter.
53. (Original) A catheter according to claim 51, wherein said at least one seal is adapted for a range of outer tube inner diameters.
54. (Original) A catheter according to claim 51, wherein said at least one seal comprises a plurality of axial spaced seals.
55. (Original) A catheter according to claim 51, wherein said at least one seal comprises only a single seal.
56. (Original) A catheter according to claim 51, wherein said at least one seal acts as a stop for preventing over-extension of said one tube.
57. (Previously Presented) A catheter according to claim 8, comprising an extension limiter which prevents steps of extension greater than a pre-set distance.
58. (Original) A catheter according to claim 57, wherein said pre-set extension step limitation is user-settable.

59. (Previously Presented) A catheter according to claim 8, comprising a lock configured to selectively lock said inner tube to said outer tube and preventing motion.
60. (Previously Presented) A catheter according to claim 8, comprising a lock configured to selectively couple said other tube to said body.
61. (Previously Presented) A catheter according to claim 8, comprising a pressure valve configured to release pressure of said working fluid above a certain liquid pressure.
62. (Previously Presented) A catheter according to claim 8, comprising a controller configured to control extension of said one tube.
63. (Original) A catheter according to claim 62, wherein said controller is adapted to extend said tube by a controlled amount.
64. (Original) A catheter according to claim 62, wherein said controller is adapted to extend said tube by setting a pressure level to be achieved in said liquid.
65. (Original) A catheter according to claim 62, wherein said controller is adapted to advance said catheter.
66. (Original) A catheter according to claim 62, wherein said controller is adapted to synchronize a locking of said catheter with inflation of a balloon portion of said catheter.
67. (Original) A catheter according to claim 62, wherein said controller is adapted to retract said tube relative to said catheter.
68. (Original) A catheter according to claim 67, wherein said controller is adapted to synchronize said retraction with advancing of said catheter.
69. (Previously Presented) A catheter according to claim 8, comprising a guiding sheath surrounding said tubes.

70. (Previously Presented) A catheter according to claim 8, comprising a guide wire, wherein said catheter is adapted to ride on said guide wire.
71. (Original) A catheter according to claim 70, wherein said catheter is configured so that said guide wire passes through said inner tube to outside a human body, when the catheter is in use.
72. (Original) A catheter according to claim 70, wherein said catheter is configured so that said guide wire passes between said inner tube and said outside tube to outside a human body, when the catheter is in use.
73. (Original) A catheter according to claim 70, wherein said catheter is configured so that said guide wire passes outside of said outside tube to outside a human body, when the catheter is in use.
74. (Original) A catheter according to claim 70, wherein said catheter is configured so that said guide wire passes outside of a guiding sheath to outside a human body, when the catheter is in use.
75. (Original) A catheter according to claim 70, comprising a balloon at said tip.
76. (Original) A catheter according to claim 75, wherein said guide wire passes through an inflation lumen of said balloon.
77. (Original) A catheter according to claim 75, wherein said guide wire has a proximal exit from said balloon adjacent said balloon.
78. (Original) A catheter according to claim 77, wherein said balloon has a thick base from which said guide wire exits.

79. (Original) A catheter according to claim 77, wherein said exit is less than 20 mm from said balloon.

80. (Original) A catheter according to claim 77, wherein said guide wire passes within an inflation lumen of said balloon.

81. (Original) A catheter according to claim 75, wherein said guide wire exits said catheter from said extending tube at a point distal from a most distal point of said non-extending tube.

82. (Original) A catheter according to claim 75, wherein said guide wire exits said catheter from said extending tube at a point proximal to a most distal point of said non-extending tube.

83. (Original) A catheter according to claim 75, wherein said guide wire passes through a seal between the two tubes.

84. (Currently Amended) A catheter according to claim 75, wherein said guide wire passes through a liquid path of said column in said catheter.

85. (Original) A catheter according to claim 75, wherein said guide wire passes only outside of a liquid path of said column in said catheter.

86. (Previously Presented) A catheter according to claim 8, wherein said inner tube comprises a standard balloon catheter, not manufactured for fluid control and wherein said liquid is carried between said outer tube and said standard balloon catheter.

87. (Previously Presented) A catheter according to claim 8, wherein said inner tube comprises a standard balloon catheter having an adjustable seal mounted thereon, and wherein said liquid is carried between said outer tube and said standard balloon catheter.

88. (Original) A catheter according to claim 87, wherein said outer tube is a guiding catheter.

89. (Previously Presented) A catheter according to claim 8, wherein said outer tube has an outer diameter of less than 3 mm.
90. (Previously Presented) A catheter according to claim 8, wherein said outer tube has an outer diameter of less than 2 mm.
91. (Previously Presented) A catheter according to claim 8, wherein said outer tube has an outer diameter of less than 1 mm.
92. (Previously Presented) A catheter according to claim 8, wherein said inner tube has an outer diameter of less than 1.5 mm.
93. (Previously Presented) A catheter according to claim 8, wherein said inner tube has an outer diameter of less than 0.5 mm.
94. (Previously Presented) A catheter according to claim 1, wherein said application point is less than 500 mm from a most distal point of said catheter.
95. (Previously Presented) A catheter according to claim 1, wherein said application point is less than 350 mm from a most distal point of said catheter.
96. (Previously Presented) A catheter according to claim 1, wherein said application point is less than 70 mm from a most distal point of said catheter.
97. (Previously Presented) A catheter according to claim 1, comprising an offset element between said application point and said tip, which application point conveys said force from said column towards said tip.
98. (Previously Presented) A catheter according to claim 1, comprising a push wire adapted to apply a second force to said tip.

99. (Original) A catheter according to claim 98, wherein said push wire applies said second force at a substantially same axial position as said application point.

100. (Original) A catheter according to claim 98, comprising a controller configured to allow a short advance of said wire, suitable for passing a narrowing in a blood vessel.

101. (Previously Presented) A catheter according to claim 1, comprising a base hub adapted to remain outside a human body, when the catheter is in use.

102. (Original) A catheter according to claim 101, wherein said base hub has only a single port for liquid pressure.

103. (Original) A catheter according to claim 101, wherein said base hub has a plurality of ports for liquid pressure.

104. (Original) A catheter according to claim 103, wherein at least one of said ports has a cover adapted to remain closed when fluid inside said port is at 5 atmospheres of pressure or more.

105. (Original) A catheter according to claim 101, wherein said base hub comprises a pressure release valve.

106. (Original) A catheter according to claim 101, wherein said base hub comprises a port for a guide wire.

107. (Original) A catheter according to claim 101, wherein said base hub comprises a port for a pushing wire.

108. (Original) A catheter according to claim 101, wherein said base hub comprises a port for a valve control wire.

109. (Original) A catheter according to claim 101, wherein said base hub comprises a port for an extension restricting wire.
110. (Original) A catheter according to claim 109, wherein said port is configured to lock said wire when said base is pressurized above a pre-set pressure value.
111. (Original) A catheter according to claim 101, wherein said base hub comprises a selector configured for selecting which of a plurality of lumens of the catheter fluid pressure will be coupled to.
112. (Original) A catheter according to claim 101, wherein said base hub comprises a closable opening suitable for selectable user access to a lumen of the catheter through the door.
113. (Original) A catheter according to claim 112, wherein said opening is adapted to be quickly opened by hand.
114. (Original) A catheter according to claim 101, wherein said base hub includes a catheter storage section having a length, wherein said length is less than 80% of a length of a catheter section stored therein.

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